# Dell Networking Z9500
# Getting Started Guide

Regulatory Model: Z9500

# Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

**CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

**WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

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# Getting Started Guide

This document is intended as a Getting Started Guide to get new systems up and running and ready for configuration. For complete installation and configuration information, refer to the documents listed below:

**Table 1. Z9500 Documents**

| Information | Documentation |
|---|---|
| Hardware installation and power-up instructions | *Installing the Z9500 Switch* |
| Software configuration | *Dell Networking OS Configuration Guide for the Z9500 Switch* |
| Command line interface | *Dell Networking OS Command Line Reference Guide for the Z9500 Switch* |
| Latest updates | *Dell Networking OS Release Notes for the Z9500 Switch* |

## Introduction

This document provides basic information about the Z9500 switch, including how to install the switch and perform the initial configuration.

For information about how to configure and monitor switch features, refer to the *Dell Networking OS Configuration Guide for the Z9500 Switch*, which is available on the Dell Support website at http://www.dell.com/support/manuals.

## Product Description

The Z9500 is part of Dell Networking's Z-Series family of Data Center Core switches.

The Z9500 switch is a compact 3 RU (Rack Unit), high-performance, and low-latency 10/40–Gigabit Ethernet switch. It runs the Dell Networking Operating Software (OS) , providing features and capabilities that are widely deployed.

The Z9500 switch has the following features:

- 132 fixed Quad Small Form-Factor Pluggable (QSFP+) ports on the I/O side of the switch.
- Four slots on the Utility side of the switch for hot swappable power supplies.
- Five slots on the Utility side of the switch for hot swappable fan modules.
- A management and console interface on the I/O side of the switch.

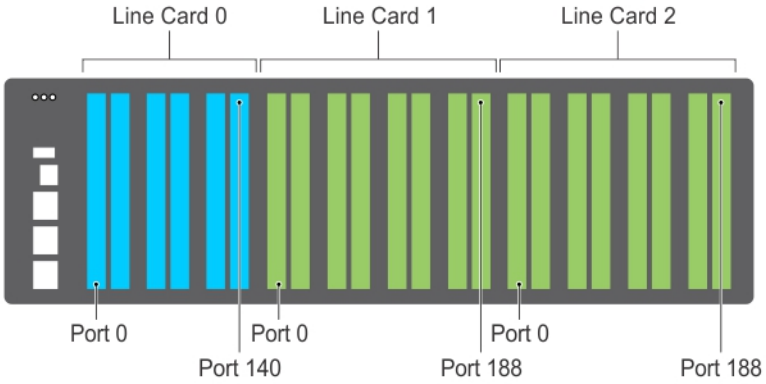



**Figure 1. I/O Side**

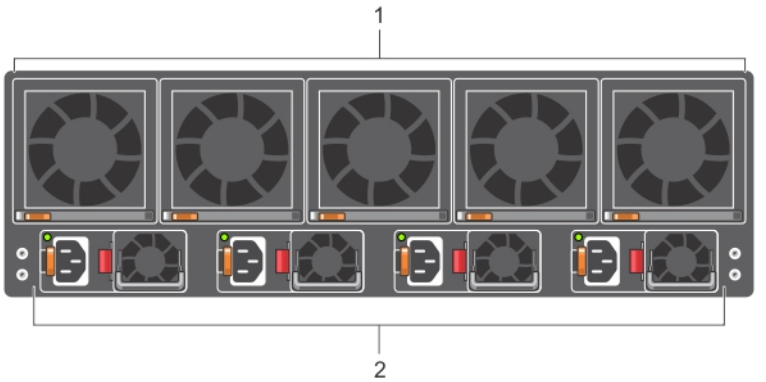



**Figure 2. Utility Side**

1. Fan Trays
2. Power Supllies

# Unpacking the Switch

The switch and its accessories are shipped in a single box. The power cords may be shipped in a separate box. Before unpacking the switch, inspect the container and immediately report any evidence of damage. Verify that you have received your ordered items, including the following:

**WARNING: If any item is missing or damaged, contact your Dell Networking representative or reseller for instructions.**

**CAUTION: Always wear an ESD-preventive wrist or heel ground strap when handling the switch and its components. Ground yourself by using an antistatic wrist strap or other device and connect it to the ESD grounding jack on the chassis. As with all electrical devices of this type, take all necessary safety precautions to prevent injury when installing this system.**

**CAUTION: The system is packaged in one or two separate containers. Use an equipment lift or pallet jack to lift or install the chassis. Lifting the system by its shelves will cause damage to the chassis**

- Z9500 switch
- Static-Rail kit (#1 and #2 Phillips and flat-tipped screwdrivers required)

NOTE: **One Rail Kit is required** for every chassis in a rack.

- Screws for rack installation
- Console cables
- Any optional items ordered
- *Getting Started Guide*
- *Safety and Regulatory Information*
- *Warranty and Support Information*
- *Software License Agreement*

1. Place the container on a clean, flat surface and cut all straps securing the container.
2. Open the container or remove the container top.
3. Carefully remove all components from the container and place it on a secure and clean surface.
4. Remove all packing material.
5. Inspect the switch and accessories for damage.

# Getting Started Overview

To install the switch and perform the initial configuration, follow these steps:

1. Assemble 4–post rack frame.
2. Attach the mounting brackets (supports rack length between 24 and 36 inches).
3. Install the rails system.
4. Mount the chassis into a 4–post rack or cabinet using a lifting device.
5. Secure the chassis ground.
6. Install the fan modules.
7. Install the power supplies
8. Secure the power cables.
9. Install the Cable Management System (OPTIONAL)
10. Install the QSFP+ optics.
11. Supply power and power up the system.
12. Perform the initial configuration.

# Before You Start

Before installing the switch, verify that you meet these guidelines:

- Enough clearance to the front of the switch so you can read the LEDs.
- AC power cord reaches from the power outlet to the Utility-panel connector.
- Switch is rack-mounted before you install the power supply modules.
- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting. Make sure that the cabling is safely away from other devices that might damage the cables. If needed, allow one RU space between devices to provide room for cabling.
- Airflow around the switch and through the vents is unrestricted.
- Temperature around the unit does not exceed 104°F (40°C). If the switch is in a closed or multi-rack assembly, the temperature might be higher than normal room temperature.
- Humidity around the switch does not exceed 85 percent.
- Altitude at the installation site is below 6600 feet.

- The switch is installed in an environment as free as possible from dust and foreign conductive material (such as metal flakes from construction activities). Cooling mechanisms, such as fans and blowers in the switch, can draw dust and other particles causing contaminant buildup inside the chassis, which can result in system malfunction.
- The Z9500 switch does not support installation in a 1070 mm cabinet with a door.
- To install the switch, Dell Networking recommends that you complete the installation procedures in the order presented below.

  NOTE: Always handle the system and its components with care. Avoid dropping the chassis or its field replaceable units.

  NOTE: For proper ventilation, position the chassis in an equipment rack (or cabinet) with a minimum of 5 inches (12.7 cm) of clearance around exhaust vents. The acceptable ambient temperature ranges are listed in the *Environmental Parameters* section.

  **CAUTION: Always wear an ESD-preventive wrist or heel ground strap when handling the switch and its components. Ground yourself by using an antistatic wrist strap or other device and connect it to the ESD grounding jack on the chassis. As with all electrical devices of this type, take all necessary safety precautions to prevent injury when installing this system.**

# Assemble 4–Post Rack Frame

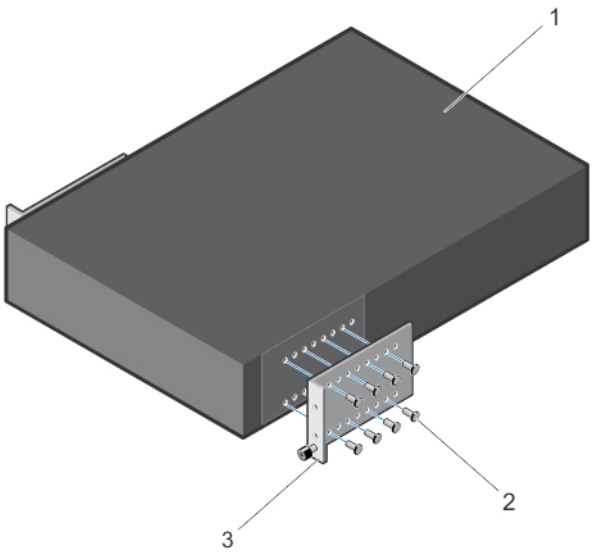
The chassis can be installed only in a 4–post rack frame.
Follow the instructions in your rack frame kit to install the 4–post rack frame.

# Attaching the Mounting Brackets

The switch is shipped with static rails mounting brackets (rack ears) and the required screws for rack or cabinet installation. The brackets are enclosed in a package with the chassis.

## Attaching the Static-Rails Mounting Brackets

1. Take the static-rail mounting brackets and screws out of their packaging.
2. Attach the brackets to the I/O side of the chassis, using eight screws for each bracket.
   Attach the bracket so that the "ear" faces to the I/O side and the outside of the chassis.




1. Utility side of the chassis
2. Screws
3. Static-rail mounting bracket

# Installing the Dell Static Rails System

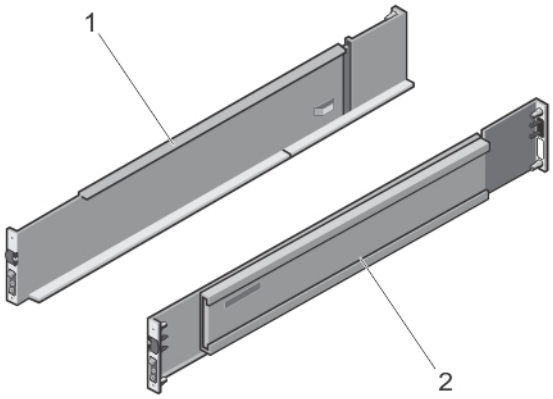
Dell Networking provides the Static Rails rack mounting system so you can easily configure a rack to install the switch.

## Identifying the Rail Kit Contents

Locate the components for installing the rail kit assembly:

- Two Dell Static Rails assemblies (1) (2).

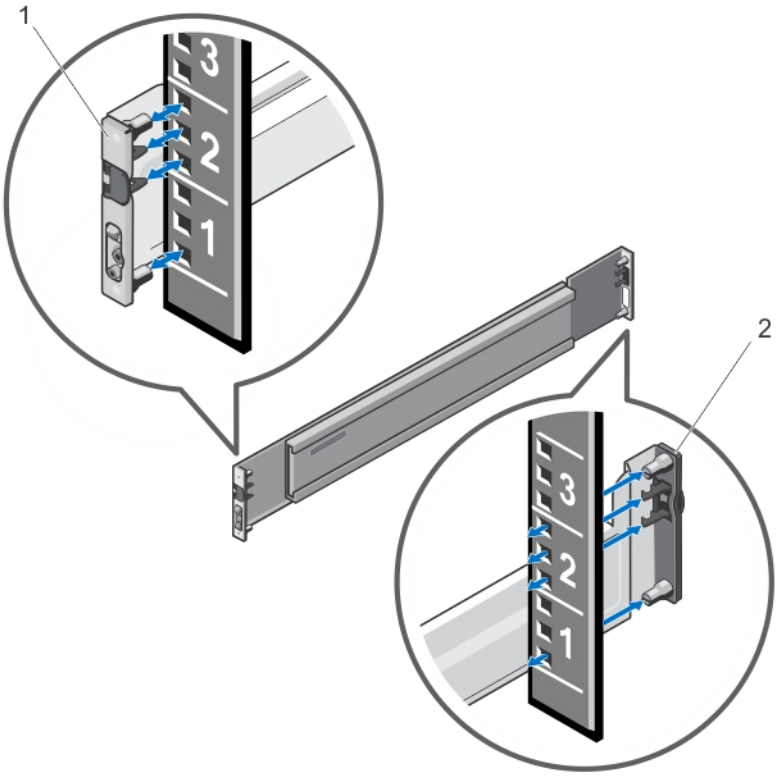
**NOTE:** Supports rack length between 24 and 36 inches.




## Installing and Removing Tool-less Rails (Square-Hole)

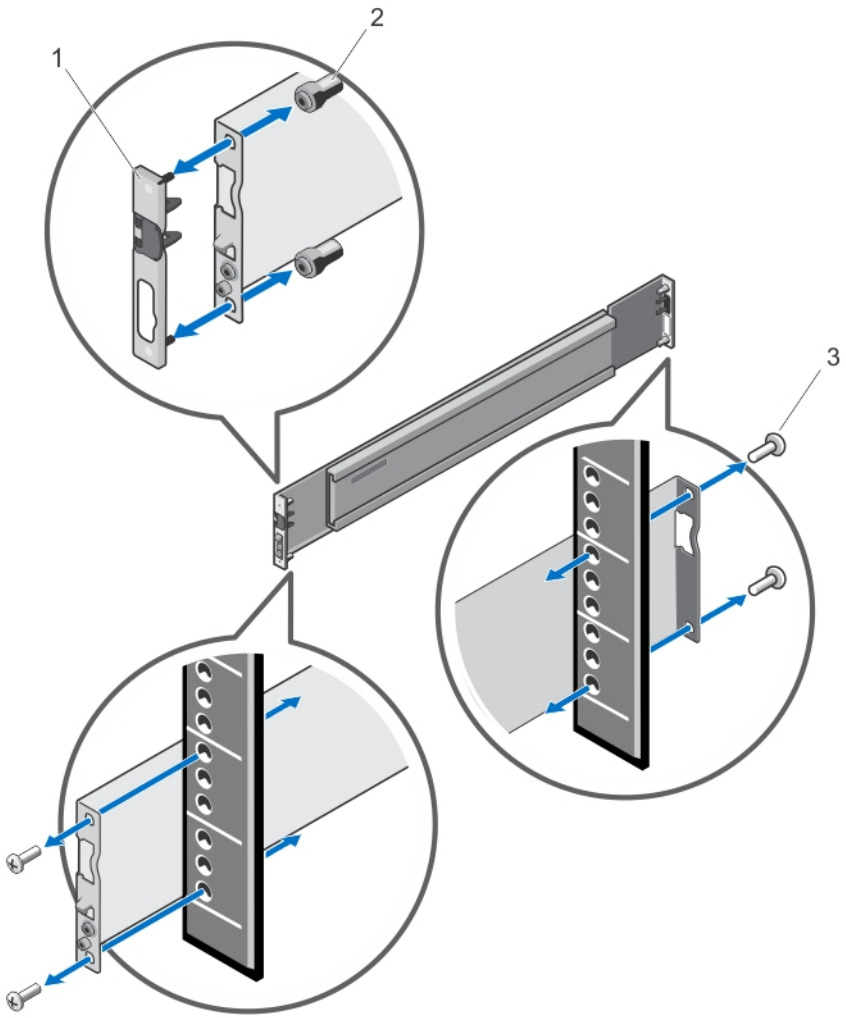
1. Position the left and right rail end pieces FRONT facing inward and orient each end piece to seat in the holes on the front side of the vertical rack flanges (1).
2. Align each end piece in the bottom and top holes of the desired U spaces (2).
3. Engage the back end of the rail until it fully seats on the vertical rack flange and the latch clicks into place. Repeat these steps to position and seat the front end piece on the vertical flange.

   **NOTE:** Make sure the blue release latch is closed.
4. To remove the rails, pull on the blue release latch on each end piece and unseat the rail from the rack.




## Installing and Removing Tooled Rails (Threaded-Hole Racks or Round-Hole Racks)

1. Remove the pins from the front and rear mounting brackets using a flat-tipped screwdriver (2).
2. Pull on the rail latch subassemblies to remove them from the mounting brackets (1).
3. Attach the left and right mounting rails to the front vertical rack flanges using two pairs of screws.
4. Slide the left and right rear brackets forward against the rear vertical rack flanges and attach them using two pairs of screws (3).




# Mounting the Chassis in a Four-Post Rack

Rack Mounting Safety Considerations

**WARNING: You must use a lifting device, such as a fork-lift trolley, to lift the chassis.**

**WARNING: These instructions are a condensed reference. Read the safety instructions in your Safety, Environmental, and Regulatory information booklet before you begin.**

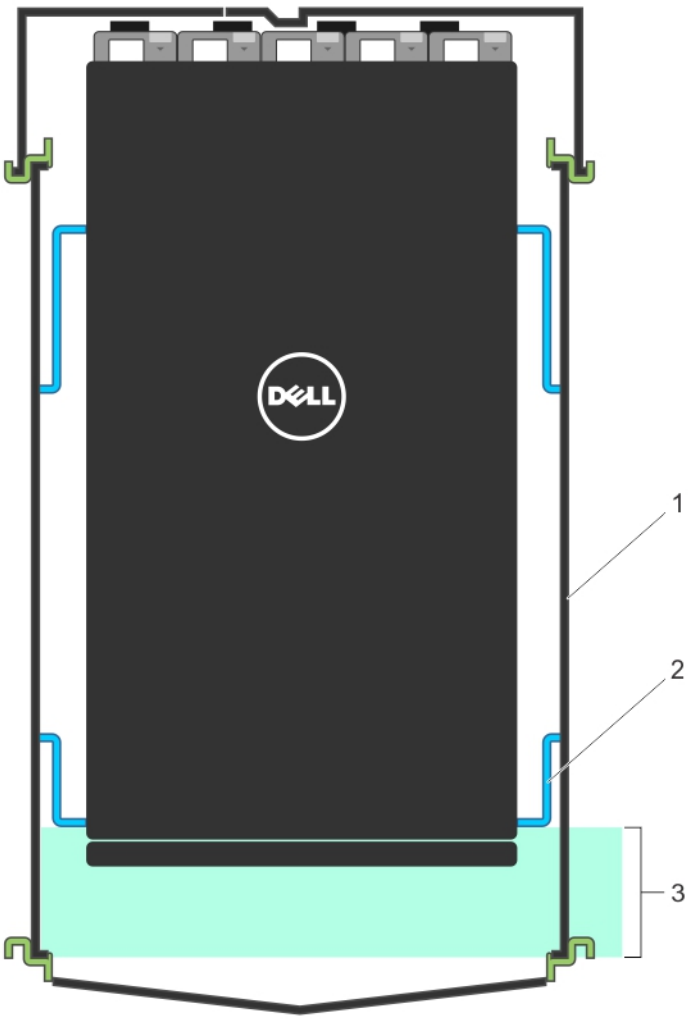
- Rack loading — Overloading or uneven loading of racks may result in shelf or rack failure, which may damage equipment and cause possible personal injury. Stabilize racks in a permanent location before loading begins. Mount the components beginning at the bottom of the rack, then work to the top. Do not exceed your rack load rating.
- Power considerations — Connect only to the power source specified on the unit. When multiple electrical components are installed in a rack, ensure that the total component power ratings do not exceed the circuit capabilities. Overloaded power sources and extension cords present fire and shock hazards.

- Elevated ambient temperature — If installed in a closed rack assembly, the operating temperature of the rack environment may be greater than the room ambient temperature. Use care not to exceed the 40°C maximum ambient temperature of the switch.
- Reduced air flow — Install the equipment in the rack so that the amount of airflow required for safe operation of the equipment is not compromised.
- Reverse air flow — Necessary clearance is required to ensure cool air intake and to avoid hot air blow out from I/O panel.
- Reliable earthing — Maintain reliable earthing of rack-mounted equipment. Pay particular attention to the supply connections other than the direct connections to the branch circuit; for example, use of power strips.
- Do not mount the equipment with the Utility panel facing in the downward position.

NOTE: The illustrations in this document are not intended to represent a specific switch.

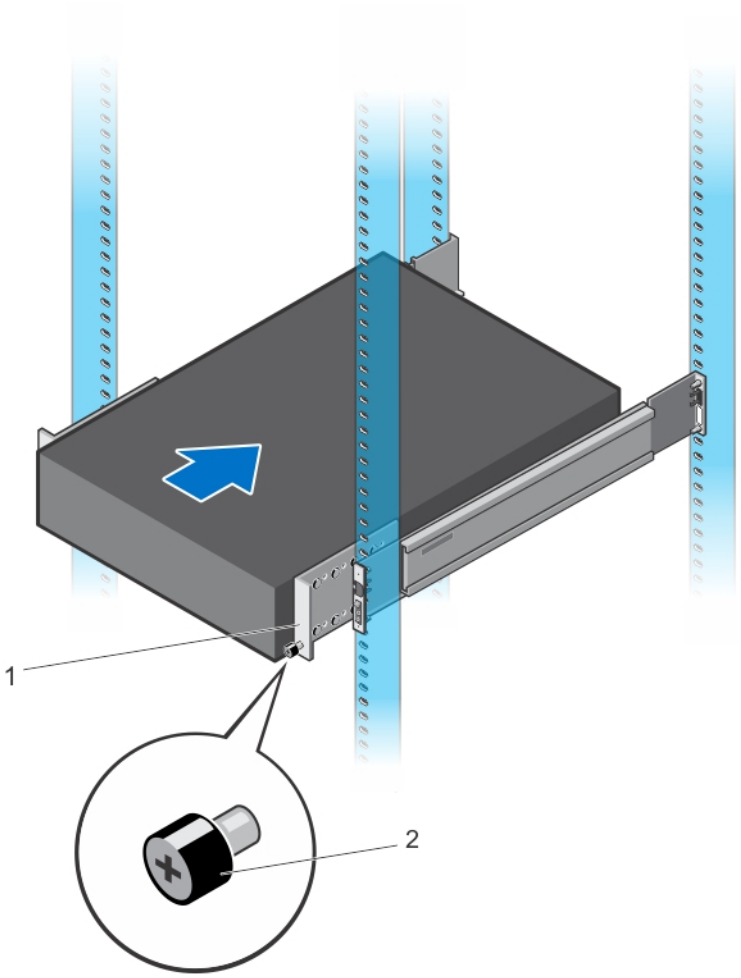
**Installing and Removing the System**

For a Dell 4226 (1070 mm) cabinet, adjust the front vertical rail inside Dell 4226 cabinet to a depth of 6.5 inches as shown in the figure below.




1. Dell 4226 (1070 mm) cabinet outline
2. Adjustable front vertical rail inside Dell 4226 cabinet
3. 6.5 inches

1. Align the system with rails and slide the system into rack.
2. Tighten the screws on each side of the systems's front panel (1).
3. To remove the system from the rack, loosen the screws and slide the system out of the rack.

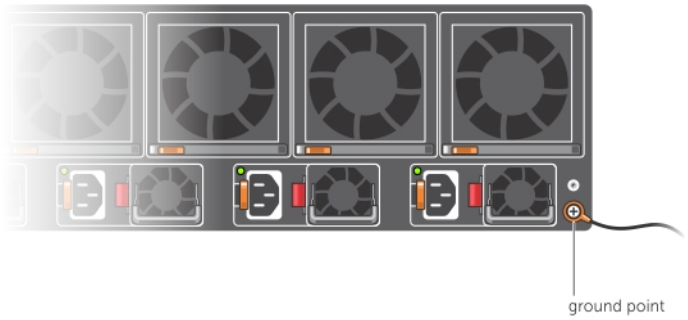



1. Additional screw to restrict front-back movement of the switch
2. Main screw

# Securing the Chassis Ground

After you mount the chassis, secure the chassis ground as follows:

1. Locate the chassis ground connector nuts on the chassis rear.




2. Install the grounding cables to the ground nuts. The grounding cable must comply with your local electrical codes in size and color (typically the color is green or green with yellow stripe).

   NOTE: For proper ventilation, position the chassis in an equipment rack (or cabinet) with a minimum of 5 inches (12.7 cm) of clearance around exhaust vents. The acceptable ambient temperature ranges are listed in the *Environmental Parameters* section.

   Use M5 screws.
3. Tighten the screws (torque should be between 18 and 24 inch/lbs).
4. Connect the opposite end of the grounding cable to the nearest appropriate facility grounding post.

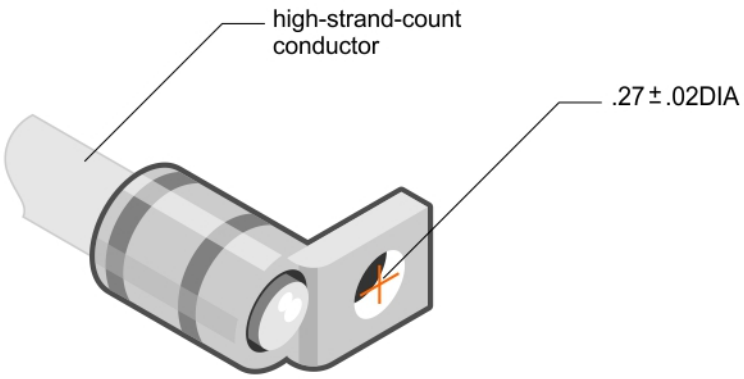



**Figure 3. Cable Connector**

# Installing Fan Modules

The chassis requires five fan modules to be installed for normal configuration. The airflow direction must be from I/O to Utility.
Important Points to Remember for Installing a Fan Module

- The Utility panel consists of five slots numbered from 0 to 4. Insert the fan modules in slots 0, 1, 2, 3, and 4.
- If a fan module fails, the system during normal operation continues to operate without a significant degradation in cooling capacity for a TBD duration.
- The cooling system is designed such that, during normal operation, the fans typically run at somewhere between 40 and 50 percent of their maximum speed at 26°C ambient temperature. This feature results in lower noise and higher average fan life. The switch increases the fan speed to maximum if the facility air condition fails or if a fan fails.
- The fan speed increases and decreases automatically based on the internal temperature. The switch never intentionally turns off the fans.
- For proper ventilation, position the switch in an equipment rack (or cabinet) with a minimum of 5 inches (12.7 cm) of clearance around the exhaust vents. When you install two systems near each other, position the two chassis at least 5 inches (12.7 cm) apart to permit proper airflow. The acceptable ambient temperature ranges are listed in Technical Specifications.
- To view the log messages, use the `show logging` command. For more information, refer to the System Logs chapters of the *Dell Networking OS Command Line Reference Guide for the Z9500 Switch* and *Dell Networking OS Configuration Guide for the Z9500 Switch*.

The fan modules are field replaceable. Module slot 0 is on the left side of the chassis; module slot 4 is on the right side of the chassis.

1. Take the fan module out of the shipping box.
2. Use the grab handle to slide the fan module into the switch fan slot, as shown below.

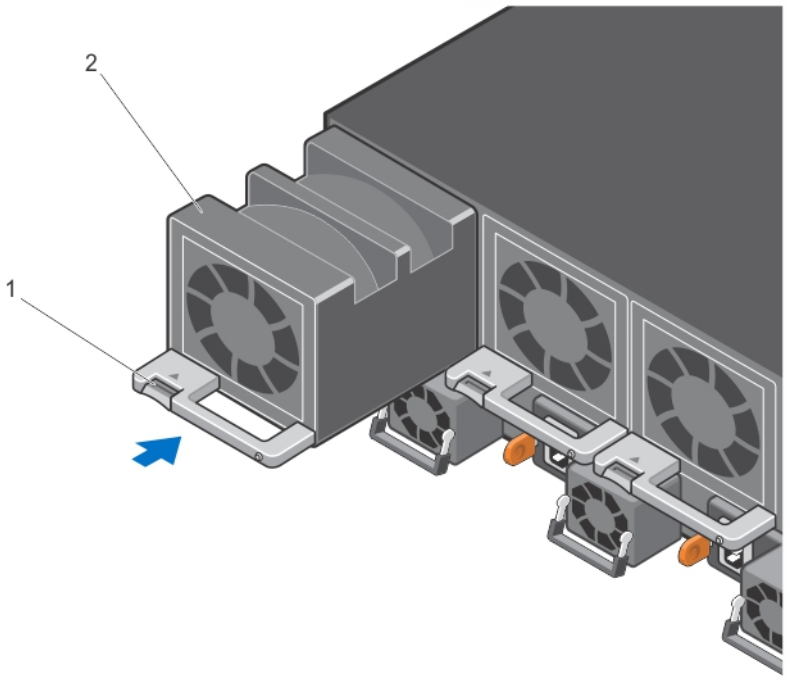



**Figure 4. Installing a Fan Module**

1. Release latch
2. Fan module 0/Slot 0

# Installing AC Power Supplies

The chassis requires four power supplies to be installed for normal configuration. The airflow direction must be from I/O to Utility.
Important Points to Remember for Installing an AC Power Supply

- The power supply unit (PSU) slides into the slot smoothly. Do not force a PSU into a slot as this action may damage the PSU or the chassis.
- The chassis supports AC power supplies with air-flow direction from I/O to Utility.
- For PSUs, a LED indicates the power status.
- To view the log messages, use the `show logging` command. For more information, refer to the System Logs chapters of the *Dell Networking OS Command Line Reference Guide for the Z9500 Switch* and *Dell Networking OS Configuration Guide for the Z9500 Switch*.

**WARNING: Although the switch can run on two PSUs, Dell Networking requires using four PSUs for full redundancy and proper cooling.**

**WARNING: The Utility panel consists of four slots numbered from 0 to 3. Insert PSUs in slots 0, 1, 2, and 3.**

**WARNING: The PSU edge connector is at the bottom. Avoid installing the PSU upside down.**

**WARNING: Electrostatic discharge (ESD) damage can occur if components are mishandled. Ground yourself by using an antistatic wrist strap or other device and connect it to the ESD grounding jack on the chassis.**

1. Remove the PSU from the electro-static bag.
2. Use the grab handle to slide the PSU into the switch PSU slot. The PSU slot is keyed so that the PSU can be fully inserted in only one way. When you install the PSU correctly, it snaps into place and is flush with the back of the switch.

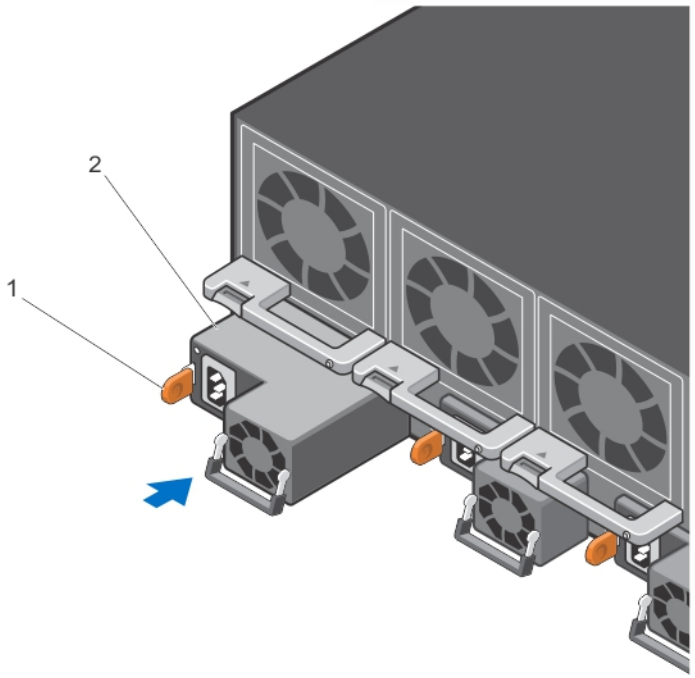



**Figure 5. Installing an AC Power Supply**

1. Release latch
2. Slot 0 (for AC PSU 0)

**CAUTION: Fan tray modules must be inserted before powering up the switch.**

**CAUTION: The switch has a high line-voltage requirement of minimum 200V.**

3. Plug in the AC3 prong cord from the switch PSU to the external power source (the AC wall outlet).

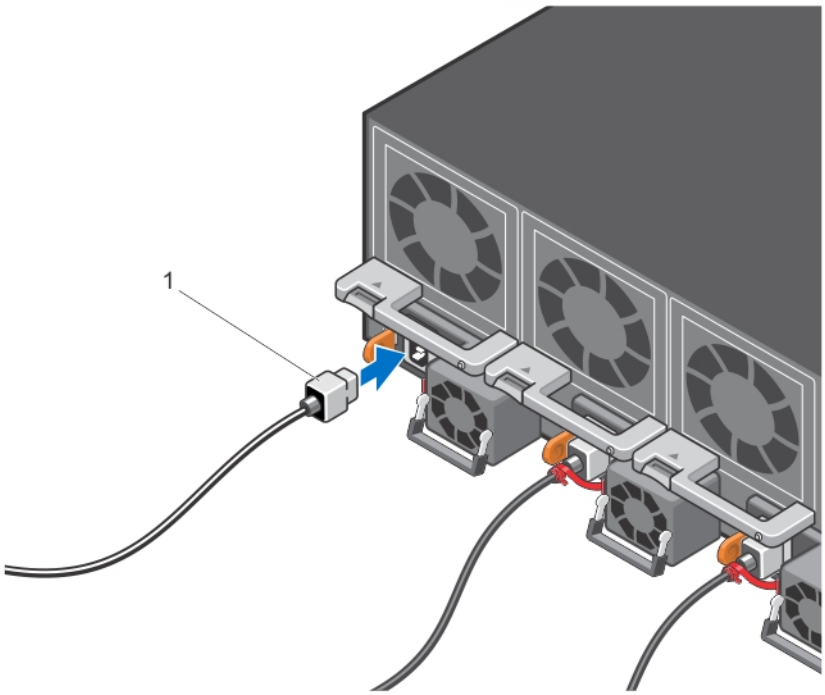



**Figure 6. Connecting AC Power Supply Cords**

1. AC3 Prong

NOTE: The system is powered-up as soon as you connect the power cord between the system and the power source.

**CAUTION: Always disconnect the power cable before you service the power supply slots.**

**CAUTION: Use the power supply cord as the main disconnect device on the AC system. Ensure that the socket-outlet is located/installed near the equipment and is easily accessible.**

4. Repeat steps 1 through 3 above for all PSUs.

NOTE: Ensure that the PSU is correctly installed. When you correctly install the PSU, the power connector is on the left side of the PSU.

# Securing Power Cables

1. Bend the system power cables, as shown in the following illustration, and attach to the cable clasp.

   NOTE: Install all four PSUs before securing the power cables.

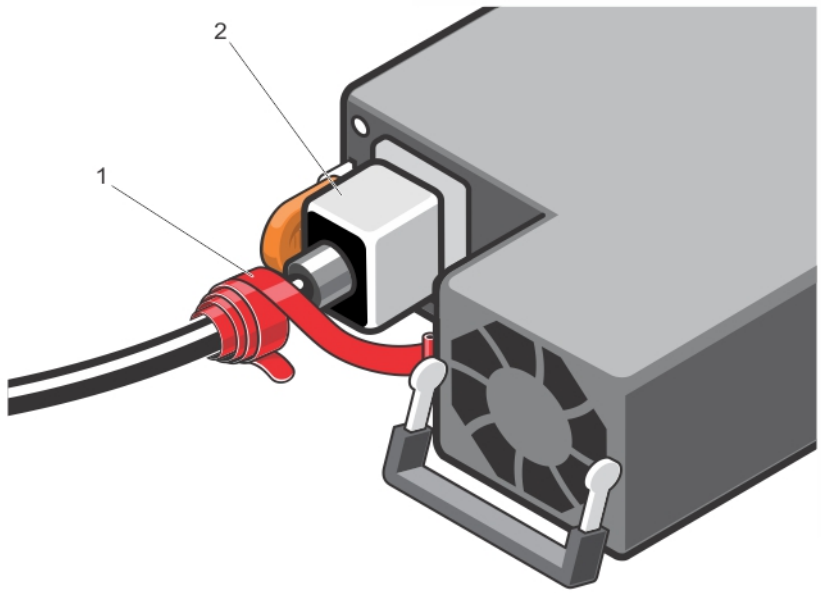



**Figure 7. Securing Power Cables**

1. Velcro strap
2. Power Cable

2. Plug the other end of the power cables into a grounded electrical outlet or a separate power source such as an uninterruptible power supply (UPS) or a power distribution unit (PDU).

**CAUTION: The switch has a high line-voltage requirement of minimum 200V.**

NOTE: For better performance, ensure that the system is connected to a stand-alone power source with stable power supply.

# Installing the Cable Management System (OPTIONAL)

You must order the cable management mount assembly separately. Mount the assembly on the top front of the chassis to organize network cables and to minimize obstruction from these cables while you insert, remove, and view the chassis components. Using the cable management system, you can attach the maximum number of cables in Z9500 I/O ports.

NOTE: The installation of the cable management system requires that you install these parts in the order presented in this document. It is recommended that you install the cable management system after the chassis is installed into the rack or cabinet.

**WARNING: When you cable the ports, be sure not to interfere with the airflow from the small vent holes above and below the ports.**

## Installing the Cable Management System for Direct Attach Copper (DAC) Cables

1. Secure the cable management system into place on the 4–post rack frame above the I/O side of the chassis by inserting screws and tightening with a #2 Phillips screwdriver.

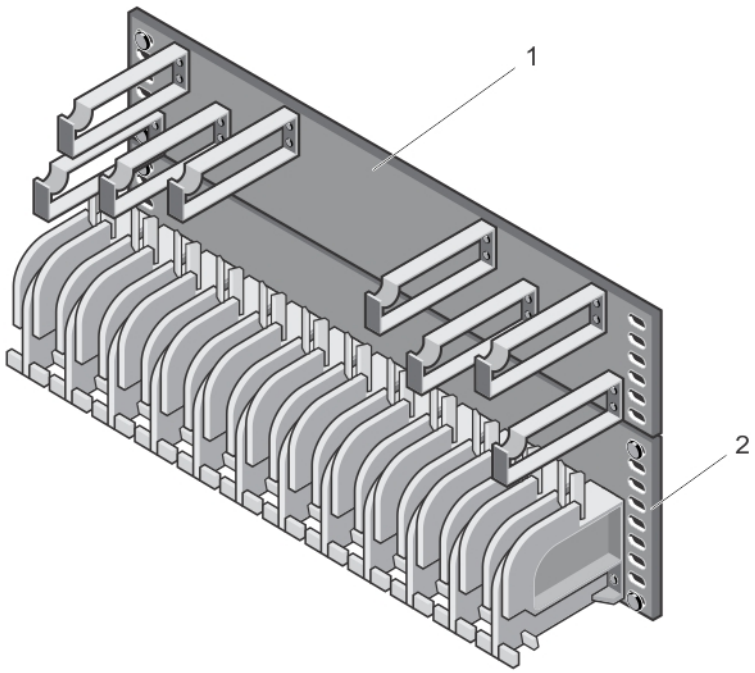



**Figure 8. Installing the Cable Management System for DAC Cables**

1. Pin rack unit for DAC cable routing
2. Rack unit for DAC cable routing

2. Insert a cable in a Z9500 port. then route the DAC cables up and along the line-card face between the larger pins directly above the card. Position the cables so they follow the channel marked in the figure below and exit to the right or left, depending on the chassis slot location. The cables should emerge from right and left side of the panel.

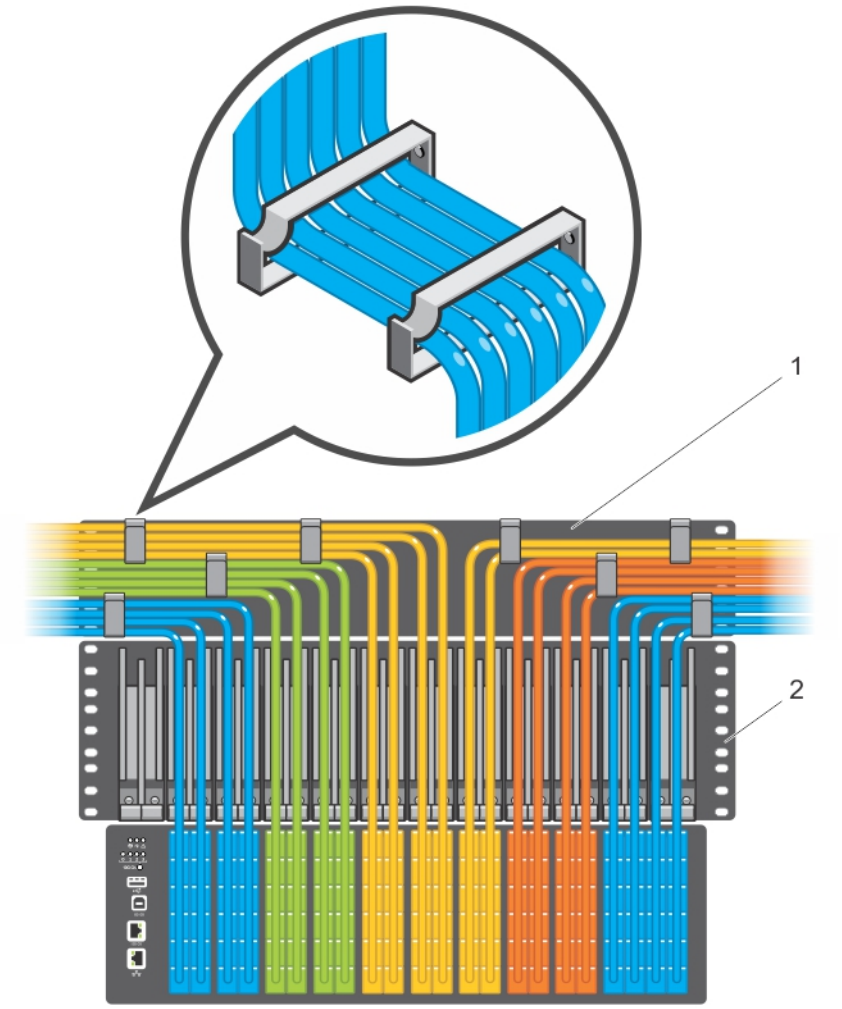



**Figure 9. Routing DAC cables using the Cable Management System**

1. Pin rack unit for DAC cable routing
2. Rack unit for DAC cable routing

NOTE: To fully populate the cable management system in a 1070 mm cabinet, the maximum supported length of the DAC cable is 5 m.

## Installing the Cable Management System for Optical Fibres

Insert an optical cable in a Z9500 port. then route the optical cable up and along the line-card face above the switch. Position the cables so they follow the channel marked in the figure below and exit to the right or left, depending on the chassis slot location. The cables should emerge from right and left side of the panel.

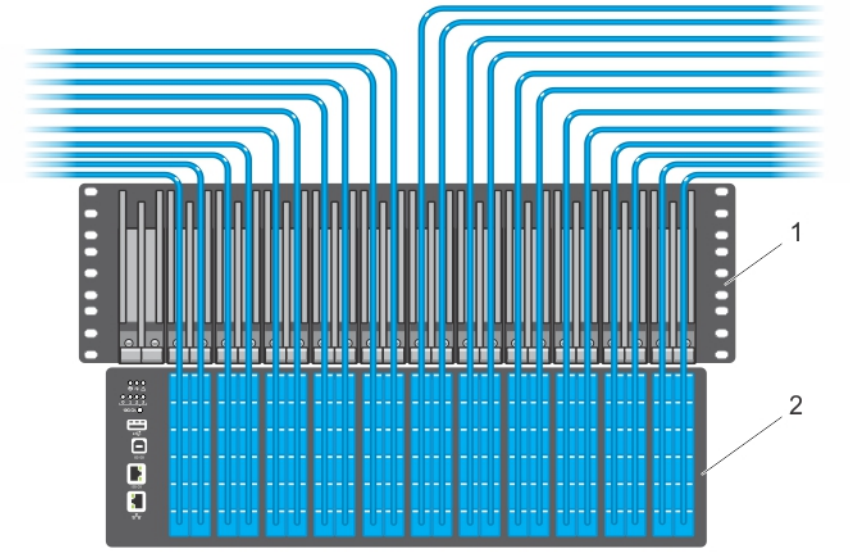



**Figure 10. Routing Optical Fibres using the Cable Management System**

1. Rack unit to be installed only for optical cables
2. Z9500 switch

**NOTE:** When the switch operates in the supported temperature range, LR4 optics can be used only in the upper half of the ports on the switch:

- Line card 0 — only in ports 12, 16, 20, 36, 40, 44, 60, 64, 68, 84, 88, 92, 108, 112, 116, 132, 136, and 140.
- Line card 1 — only in ports 12, 16, 20, 36, 40, 44, 60, 64, 68, 84, 88, 92, 108, 112, 116, 132, 136, 140, 156, 160, 164, 180, 184, and 188.
- Line card 2 — only in ports 12, 16, 20, 36, 40, 44, 60, 64, 68, 84, 88, 92, 108, 112, 116, 132, 136, 140, 156, 160, 164, 180, 184, and 188.

When the switch operates in a reduced ambient temperature, you can use LR4 optics in any port. See Port Numbering Convention for an illustration that shows port location.

# Installing the QSFP+ Optics

The switch has 132 QSFP+ optical ports, which can be used with breakout cables for 528 small form-factor pluggable plus (SFP+) optical ports.
For a list of supported optics, contact your Dell Networking representative or reseller.

**CAUTION: ESD damage can occur if the components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the switch and its components.**

**WARNING: When working with optical fibres, follow all the warning labels and always wear eye protection. Never look directly into the end of a terminated or unterminated fibre or connector as it may cause eye damage.**

1. Position the optic so it is in the correct position. The optic has a key that prevents it from being inserted incorrectly.
2. Insert the optic into the port until it gently snaps into place.

# Supplying Power and Powering Up the System

Supply power to the system after the chassis is mounted in a rack or cabinet.

**CAUTION: The switch has a high line-voltage requirement of minimum 200V.**

Dell Networking recommends reinspecting your system prior to powering up. Verify that:

- The equipment is properly secured to the rack.
- The equipment rack is properly mounted and grounded.
- The ambient temperature around the unit (which may be higher than the room temperature) is within the limits specified for the switch.
- There is sufficient airflow around the chassis.
- The input circuits are correctly sized for the loads and that you use sufficient overcurrent protection devices.

NOTE: For powering up the AC PSUs, AC power cables are included in the shipping container. You must order all other power cables separately.

**CAUTION: ESD damage can occur if the components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the switch and its components.**

When the system powers up, the fans come on at medium speed. The fan speed slows as the system boots up. The system status LED blinks until the boot-up sequence is complete. When the boot up is complete, the power status LED is steadily lit.

## AC Power

**CAUTION: Ensure that the PSU is installed correctly.**

Connect the plug to each AC power connector. Make sure that the power cord is secure.

As soon as the cable is connected between the switch and the power source, the chassis is powered-up; there is no on/off switch.

# Performing the Initial Configuration

The system has two management ports available for system access — a console port and a universal serial bus (USB)-B port. The USB-B port acts the same as the console port. The terminal settings are the same for both access ports.

The system supports bare metal provisioning (BMP). For information about how to configure BMP, refer to *Dell Networking OS Configuration Guide for the Z9500 Switch*.

## Software Configuration Overview

To configure the system, follow these steps:

1. Access the RJ-45/RS-232 console port.
2. Enter the initial configuration information.
3. Configure the enable password.
4. Configure a host name.
5. Configure layer 2 (data link) mode.
6. Configure the management port IP address.
7. Configure a management route.
8. Configure a username and password.
9. Create a port-based VLAN.
10. Assign interfaces to a VLAN.
11. Assign an IP address to a VLAN.
12. Connect the system to the network.

## Accessing the RJ-45/RS-232 Console Port

NOTE: Before starting this procedure, be sure that you have a terminal emulation program already installed on your PC.

The DB9 RS-232/RJ-45 console port is labeled on the lower left-hand side of the switch as you face the Utility side of the chassis.

1. Install an RJ-45 copper cable into the console port. Use a rollover cable to connect the console port to a terminal server.
2. Connect the other end of the cable to the DTE terminal server.
3. Set the default terminal settings as follows:
   a) 9600 baud rate
   b) No parity
   c) 8 data bits
   d) 1 stop bit
   e) No flow control

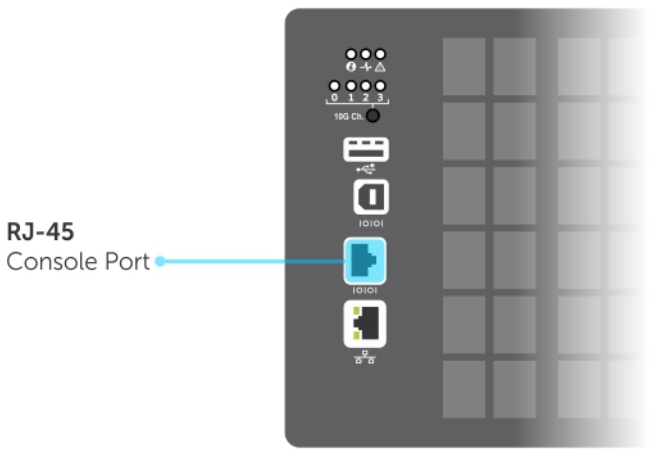



**Figure 11. RS-232/RJ-45 Console Port**

## Accessing the RJ-45 Console Port with a DB-9 Adapter

You can connect to the console using an RJ-45 to RJ-45 rollover cable and an RJ-45 to DB-9 female DTE adapter to a terminal server (for example, a PC).

The pin assignments between the console and a DTE terminal server are as follows:

**Table 2. Pin Assignments Between the Console and a DTE Terminal Server**

| Console Port | RJ-45 to RJ-45 Rollover Cable | RJ-45 to RJ-45 Rollover Cable | RJ-45 to DB-9 Adapter | Terminal Server Device |
|---|---|---|---|---|
| **Signal** | **RJ-45 Pinout** | **RJ-45 Pinout** | **DB-9 Pin** | **Signal** |
| RTS | 1 | 8 | 8 | CTS |
| NC | 2 | 7 | 6 | DSR |
| TxD | 3 | 6 | 2 | RxD |
| GND | 4 | 5 | 5 | GND |
| GND | 5 | 4 | 5 | GND |
| RxD | 6 | 3 | 3 | TxD |
| NC | 7 | 2 | 4 | DTR |
| CTS | 8 | 1 | 7 | RTS |

## Accessing the USB-B Console Port

The terminal settings are the same for the USB-B port and the console port:

- 9600 baud rate
- No parity
- 8 data bits
- 1 stop bit
- No flow control

When you connect the USB-B port, it becomes the primary connection and, when the system is connected, it sends all messages to the USB-B drive.

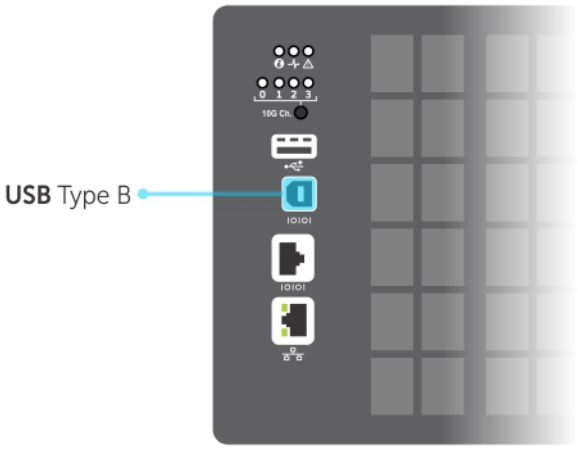



**Figure 12. USB-B Console Port Connector**

1. Power on the PC.
2. Install the necessary USB device drivers (you will need an Internet connection). For assistance, contact Dell Networking Technical Support.
3. Connect the USB-A end of cable into an available USB port on the PC.
4. Connect the USB-B end of cable into the USB-B console port on the system.
5. Power on the system.
6. Open your terminal software emulation program to access the system.
7. Set the terminal connection settings. Use these settings.
   - 9600 baud rate
   - No parity
   - 8 data bits
   - 1 stop bit
   - No flow control

The CLI prompt appears (`Dell>_`) when you are connected to the system.

**NOTE:** Only one of the console ports can be active at a time; the USB console takes priority over the RJ-45 console by default. When a USB Host (PC) is plugged into the USB console port, the hardware automatically switches over to use the USB console. When you remove the USB cable or the PC deactivates the USB connection, the hardware automatically switches to the RJ-45 console interface.

## Enter the Initial Configuration Information

To set up the switch, assign an IP address and other configuration information necessary for the switch to communicate with the local routers and the Internet. The minimal configuration provided here does not cover most of the features; it simply allows you to perform other configuration tasks using a Telnet connection from your management network. To configure other features and interfaces, refer to the *Dell Networking OS Configuration Guide for the Z9500 Switch*.

### IP Settings

You will need the following information from your network administrator:

- Switch IP address
- Subnet mask (IP netmask)
- Default gateway (router)
- Enable secret password
- Enable password
- Telnet password

## Configuring the Enable Password

To access EXEC Privilege mode, use the `enable` command. EXEC Privilege mode is unrestricted by default. Configure a password as a basic security measure.

There are two types of enable passwords:

- `enable password` — stores the password in the running/startup configuration using a data encryption standard (DES) encryption method.
- `enable secret` — is stored in the running/startup configuration in a stronger, MD5 encryption method.

**NOTE:** Dell Networking recommends using the `enable secret` password.

- Create a password to access EXEC Privilege mode.

  CONFIGURATION MODE

  `enable [password | secret] [level` *`level`*`] [`*`encryption-type`*`]`

  *`level`* is the privilege level and is not required. The default is **15**.

  *`encryption-type`***:** specifies how you are inputting the password and is not required. The default is **0**.

  - 0 is for inputting the password in clear text.
  - 7 is for inputting a password that is already encrypted using a DES hash. Obtain the encrypted password from the configuration file of another Dell Networking system.
  - 5 is for inputting a password that is already encrypted using an MD5 hash. Obtain the encrypted password from the configuration file of another Dell Networking system.

## Configuring a Host Name

The host name appears in the prompt. The default host name is `Dell`. Host names must start with a letter, end with a letter or digit, and must have characters, letters, digits, and hyphens in the string.

- Create a host name.

  CONFIGURATION mode

  `hostname` *`name`*

## Navigate CLI modes

The Dell prompt changes to indicate the CLI mode. You must move linearly through the command modes, except for the `end` command which takes you directly to EXEC Privilege mode and the `exit` command which moves you up one command mode level.

## Default Configuration

A version of Dell Networking OS is preloaded onto the system; however, the system is not configured when you power up for the first time (except for the default host name, which is `Dell`). You must configure the system using the CLI.

## Configuring Layer 2 (Data Link) Mode

To enable Layer 2 data transmissions through an individual interface, use the `switchport` command in INTERFACE mode. You cannot configure switching or Layer 2 protocols, such as spanning tree protocol (STP), on an interface unless the interface has been set to Layer 2 mode.

1. Enable the interface.
   INTERFACE mode
   ```
   no shutdown
   ```
2. Place the interface in Layer 2 (switching) mode
   INTERFACE mode
   ```
   switchport
   ```

To view the interfaces in Layer 2 mode, use the `show interfaces switchport` command in EXEC mode.

## Port Numbering Convention

On the switch, all ports operate by default in 40GbE mode. If you use a breakout cable, each port can operate in 4x10GbE mode.

Ports are located on three line cards as shown below. The line cards are factory-installed and are not hot-swappable or field-replaceable. On each line card, the fixed 40GbE ports are numbered from bottom to top in multiples of four, starting with zero; for example, 0, 4, 8, 12, and so on. When a breakout cable is installed, the resulting four 10GbE ports are numbered with the remaining numbers. For example, 40GbE port 0 contains 10GbE ports 0, 1, 2, and 3; 40GbE port 4 contains 10GbE ports 4, 5, 6, and 7.

Line card 0 consists of ports 0 to 143; line card 1 consists of ports 0 to 191; line card 2 consists of ports 0 to 191.

**Figure 13. Port Numbering**

## Accessing the System Remotely

You can configure the system to access it remotely by Telnet.
The system has a dedicated management port and a management routing table that is separate from the IP routing table.

1. Configure an IP address for the management port (refer to Configuring the Management Port IP Address).
2. Configure a management route with a default gateway (refer to Configuring a Management Route).
3. Configure a username and password (refer to Configuring a Username and Password).

## Configuring the Management Port IP Address

To access the system remotely, assign IP addresses to the management ports.

**NOTE:** Assign different IP addresses to each stack-unit's management port.

1. Enter INTERFACE mode for the Management port.
   CONFIGURATION mode
   ```
   interface ManagementEthernet slot/port
   ```
   - *slot* range: 0
   - *port* range: 0
2. Assign an IP address to the interface.
   INTERFACE mode
   ```
   ip address ip-address/mask
   ```
   - *ip-address*: an address in dotted-decimal format (A.B.C.D).
   - *mask*: a subnet mask in /prefix-length format (/ xx).
3. Enable the interface.
   INTERFACE mode
   ```
   no shutdown
   ```

## Configuring a Management Route

Define a path from the system to the network from which you are accessing the system remotely. Management routes are separate from IP routes and are only used to manage the system through the management port.

- Configure a management route to the network from which you are accessing the system.
  CONFIGURATION mode
  `management route ip-address/mask gateway`
  - *ip-address*: the network address in dotted-decimal format (A.B.C.D).
  - *mask*: a subnet mask in /prefix-length format (/ xx).
  - *gateway*: the next hop for network traffic originating from the management port.

## Configuring a Username and Password

- Configure a username and password to access the system remotely.
  CONFIGURATION mode
  `username username password [encryption-type]`
  *encryption-type* specifies how you are inputting the password, is 0 by default, and is not required.
  - 0 is for inputting the password in clear text.
  - 7 is for inputting a password that is already encrypted using a Type 7 hash. Obtaining the encrypted password from the configuration of another Dell Networking system.

## Splitting QSFP+ Ports to SFP+ Ports

The system supports splitting a single 40GbE QSFP+ port into four 10GbE SFP+ ports using one of the supported breakout cables.

For a list of supported optics, contact your Dell Networking representative or reseller.

- Configure the system to recognize the port mode change.
  CONFIGURATION mode
  `linecard number port number portmode quad`
  - *port <number>*- Enter the port number of the 40GbE port to be split. The range is 48 to 60.
  - *portmode quad* - Configure a 40GbE port to operate in 4 x 10GbE mode.

**Example of splitting a QSFP+ port to SFP+ ports**

```
linecard 0 port 52 portmode quad
```

### Important Points to Remember

- A 40GbE (quad) port must be in a default configuration before you can split it into four 10GbE SFP+ ports. When you split the port, the 40GbE port is lost in the running configuration. Be sure that the port is also removed from other L2/L3 feature configurations.
- For the split-port change to take effect, you must reload the system after issuing the CLI change commands.

## Creating a Port-based VLAN

The default virtual local area network (VLAN) (VLAN 1) is part of the system startup configuration and does not require configuration.
To configure a port-based VLAN, create the VLAN and then add physical interfaces or port channel (LAG) interfaces to the VLAN.

- Configure a port-based VLAN (if the VLAN-ID is different from the Default VLAN ID) and enter INTERFACE VLAN mode.

  CONFIGURATION mode

  `interface vlan` *`vlan-id`*

  After you create a VLAN, you must assign interfaces in Layer 2 mode to the VLAN to activate the VLAN.

To view the configured VLANs, use the `show vlan` command in EXEC Privilege mode.

## Assigning Interfaces to a VLAN

You can only assign interfaces in Layer 2 mode to a VLAN using the `tagged` and `untagged` commands.
To place an interface in Layer 2 mode, use the `switchport` command.
You can designate Layer 2 interfaces as tagged or untagged. When you place an interface in Layer 2 mode using the `switchport` command, the interface is automatically designated untagged and placed in the Default VLAN.

To view which interfaces are tagged or untagged and to view which VLAN the interfaces belong, use the `show vlan` command.

To view just the interfaces that are in Layer 2 mode, use the `show interfaces switchport` command in EXEC Privilege mode or EXEC mode.

To tag frames leaving an interface in Layer 2 mode, you must assign that interface to a port-based VLAN to tag it with that VLAN ID.

1. Access the INTERFACE VLAN mode of the VLAN to which you want to assign the interface.

   CONFIGURATION mode

   `interface vlan` *`vlan-id`*
2. Enable an interface to include the IEEE 802.1Q tag header.

   INTERFACE mode

   `tagged` *`interface`*

   To move untagged interfaces from the Default VLAN to another VLAN, use the `untagged` command.
3. Access the INTERFACE VLAN mode of the VLAN to which you want to assign the interface.

   CONFIGURATION mode

   `interface vlan` *`vlan-id`*
4. Configure an interface as untagged. This command is available only in VLAN interfaces.

   INTERFACE mode

   `untagged` *`interface`*

## Assigning an IP Address to a VLAN

VLANs are a Layer 2 feature. For two physical interfaces on different VLANs to communicate, you must assign an IP address to the VLANs to route traffic between the two interfaces. The `shutdown` command in INTERFACE mode does not affect Layer 2 traffic on the interface.

**NOTE:** You cannot assign an IP address to the Default VLAN, which, by default, is VLAN 1. To assign another VLAN ID to the Default VLAN, use the default `vlan-id vlan-id` command.

- Configure an IP address and mask on the interface.

  INTERFACE mode

  `ip address ip-address mask [secondary]`

## Connecting the System to the Network

After you have completed the hardware installation and software configuration for the system, you can connect to your company network by following your company's cabling requirements.

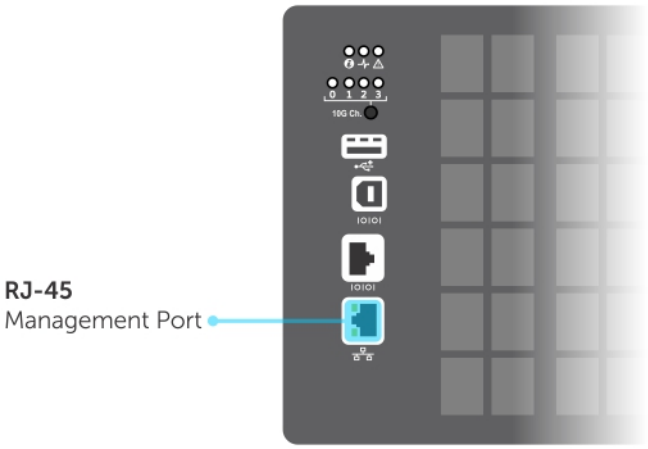



**Figure 14. RJ-45 Network/Management Port**

# Technical Specifications

**NOTE:** Operate the product at an ambient temperature not higher than 40°C.

**Table 3. Chassis Physical Design**

| Parameter | Specifications |
|---|---|
| Height | 5.2 inches (132.08 mm) |
| Width | 17.4 inches (441.96 mm) |
| Depth | 32 inches (812.80 mm) |
| Chassis weight with factory-installed components | 122 pounds (Approximately) |
| Rack clearance required | • Front: 5 inches (12.7 cm) |

| Parameter | Specifications |
| --- | --- |
| | • Rear: 5 inches (12.7 cm) |

**Table 4. Environmental Parameters**

| Parameter | Specifications |
| --- | --- |
| Operating temperature | 32° to 104°F (0° to 40°C) |
| Operating humidity | 10 to 85 percent (RH), noncondensing |
| Storage temperature | -40° to 158°F (-40° to 70°C) |
| Storage humidity | 5 to 95 percent (RH), noncondensing |
| Maximum thermal output | 10567 BTU/hr |
| Maximum Altitude | No performance degradation up to 6600ft. Ambience derating required for higher altitude. |

**Table 5. Power Requirements**

| Parameter | Specifications |
| --- | --- |
| AC Power supply | 200 VAC ~ 240 VAC 50/60 Hz |
| Maximum AC current per supply | 10.5A |
| Maximum power consumption | 3100 Watts |
| Typical power consumption | 2200 Watts |